

CLAIMS

1. An encoder output divider configured to divide an encoded signal comprising:

a timer configured to measure a first timing cycle of the encoded signal, the encoded signal having a first period based on the measured first timing cycle; and

a divider coupled to the timer and configured to generate a divided encoded signal according to a second period, the second period related to the first period by a multiplication factor of $1/n$, where n includes an integer having a value of 2 or more.

2. An encoder output divider according to claim 1, further comprising:

a calculator coupled to the divider and the timer and configured to calculate the calculated value based on the measured first timing cycle; and

an output selector coupled to the calculator, the divider and the timer and configured such that when the calculated value is within a designated range, the divided encoded signal is selected for output, and when the calculated value is outside the designated range, the encoded signal is selected for output.

3. An encoder output divider according to claim 2, wherein:
the value includes a rotational speed associated with a
resolver; and

the output selector is configured such that when the calculated rotational speed is within a designated range of rotational speeds, the divided encoded signal is selected for output, and when the calculated rotational speed is outside the designated range of rotational speeds, the encoded signal is selected for output.

4. An encoder output divider according to claim 3, wherein the designated range of rotational speeds includes speeds from 400 rpm to 1200 rpm.

5. A resolver/digital (R/D) converter configured to find an angle of a rotor axis of a resolver based on a sine wave output and a cosine wave output of the resolver, the R/D converter comprising:

a converter configured to convert the sine wave output and cosine wave output of the resolver into a first encoded signal and a second encoded signal;

a timer coupled to the converter and configured to measure a cycle of one of the first encoded signal and the second encoded signal, the measured cycle corresponding to a first period associated with the one of the first encoded signal and the second encoded signal; and

a signal generator coupled to the converter and the timer and configured to generate a divided encoded signal having a second period, the second period related to the first period by a multiplication factor of $1/n$, where n includes an integer having a value of 2 or more.

6. An R/D converter according to claim 5, further comprising:

a calculator coupled to the signal generator, the converter, and the timer, the calculator configured to calculate the rotational speed of the resolver based on the measured cycle of the one; and

an output selector coupled to the calculator, the signal generator, the converter, and the timer, the output selector configured to select the divided encoded signal for output when the calculated rotational speed of the resolver is within a designated range, to select the encoded signal for output when the calculated rotational speed is outside the designated range.

7. An R/D converter according to claim 6, wherein the designated range of rotational speeds includes rotational speeds from 400 rpm to 1200 rpm.

8. An encoder capable of generating a divided encoded signal, the encoder comprising:

a converter configured to convert a sine wave signal and a cosine wave signal from a resolver into a first encoded signal and a second encoded signal having a first period; and

a digital signal processor (DSP) coupled to the converter, the DSP configured to:

measure a first cycle of one of the first encoded signal and the second encoded signal to determine the first period,

generate the divided encoded signal having a second period related to the determined first period by a value of $1/n$ where n is an integer of 2 or greater,

determine a rotational speed associated with the resolver based on the measured first cycle, and

provide a selection signal such that when the rotational speed is within a designated range, the selection signal indicates that the divided encoded signal should be output, and when the rotational speed is outside the designated range, the one of the first and the second encoded signals should be output.

9. An encoder according to claim 8, wherein the DSP is further configured to generate a second divided encoded signal offset from the first divided encoded signal by half of the first cycle,

the encoder further comprising:

a multiplexer coupled to the DSP and the converter, the multiplexer configured to receive the selection signal and output the first divided encoded and the second divided encoded signal when the rotational speed is within the designated range and output the first and the second encoded signals when the rotational speed is outside the designated range.